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P R O C E E D I N G S

O F T H E

A M E R I C A N P H I L O S O P H I C A L S O C I E T Y ,

H E L D A T P H I L A D E L P H I A .

VOL. XIX.

MARCH to DECEMBER, 1880.

No. 107.

Stated Meeting, March 19, 1880.

Present, 8 members.

Visitor, Mr Hampton L. Carson of Philadelphia.

Letters of envoy were received from the Central Physical Observatory at St. Petersburg, January, 1880; from the Royal Observatory at Greenwich, February, 1880, and from the Meteorological Society in London, February, 1880.

Donations for the Library were reported as received from the Asiatic Soc., Yokohama; Russian Academy; Botanische Central-blatt, Leipsig; Deutsche Rundschau für Geog. u. Stat., Munich; Belgian Academy; Geographical Societies at Paris and Bordeaux; the Revue Politique; Revista Euskara, Pamplona; British Association; Society of Antiquaries; Meteorological Council of the Royal Society, London; Natural History Society, Montreal; Museum of Comp. Zoöl. Cambridge, Mass.; Franklin Institute, Medical News, Dr. Alfred Stillé, Dr. C. P. Krauth, and Mr. Henry Phillips, Jr. of Philadelphia; Smithsonian Institution; Bureau of

Education ; Engineer Department, Washington ; Ministerio de Fomento, Mexico ; and Prof. S. S. Haldeman.

Donation for the Cabinet.—Mr. Hampton L. Carson presented, on the part of his sisters and himself, in fulfillment of his father's wishes, to the cabinet of the Society, a portrait in oils of M. François André Michaux, the botanist, who died at Paris, October 23d, 1855, ætat 85.

Mr. Fraley returned the thanks of the Society for so interesting and valuable a relic of our distinguished fellow-member, who exhibited in his lifetime so great an attachment for the Society, and in his will such confidence in the honor of its traditions as to make it the trustee of a fund which he bequeathed for Silviculture in America.

Mr. E. K. Price also described the amicable relations which existed between M. Michaux and the Society, claiming the privilege of doing so on the ground that the Society had conferred on him the duty of carrying out the designs of M. Michaux according to the plan adopted by the Committee and approved by the Society, and sketched the principal features of that plan—the planting of the Michaux grove—and the organization of Prof. Rothrock's annual course of public lectures in the Park.

It was then on motion

Resolved, That the thanks of the Society be presented to Mr. Hampton L. Carson and his sisters for their gift of the portrait of M. F. A. Michaux whose liberal bequest to the Society is now so beneficially available for the promotion of Silviculture and Botany.

Resolved, That the Society appreciate the gift more highly because it has been made in compliance with the wish of the late Dr. Joseph Carson, one of its devoted and useful members, whose memory is endeared to his associates by many recollections of his worth and virtues.

Resolved, That a copy of these resolutions be transmitted to Mr. Carson.

The death of Dr. William Theodore Roepper, at his residence in Bethlehem, Pa., on Wednesday, March 10th, at the age of 70, was announced by Mr. Lesley.

On motion, Dr. F. A. Genth was appointed to prepare an obituary notice of the deceased.

The death of General Hector Tyndale, at his residence in

Clinton street, Philadelphia, on Friday, March 19th (3 A. M.), at the age of 58, was announced by Mr. J. S. Price.

A communication was received entitled "Nodal estimate of the velocity of Light," by P. E. Chase.

Mr. Phillips read a paper describing two very old and curious maps of North and South America.

Dr. Greene communicated a paper "On the action of hydrochloric acid and chlorine on acetobenzoic anhydride," by Wm. H. Greene, M.D.

Pending nominations Nos. 893 to 901, and new nominations Nos. 902 to 908, were read.

The publication of the proceedings at the late celebration of the Centennial Anniversary of the Incorporation of the Society was then discussed.

The Committee on the Michaux Legacy reported through its chairman, Mr. E. K. Price :

"That the appropriation made last year was applied to defray the expenses of fourteen lectures in the Horticultural Hall, Fairmount Park, by Dr. Rothrock. It was attended by more than previous members, varying from one to two hundred persons. Teachers in the public schools numerously availed themselves of this valuable opportunity of studying Botany.

"Dr. Rothrock feels it important to spend the later summer and autumn in Germany, in the pursuit of his studies. His course this year will be seven lectures, for which an appropriation is respectfully asked."

On motion an appropriation of one hundred and seventy dollars was made, from the income of the Michaux fund, for defraying the expenses of the seven lectures of Prof. Rothrock, and advertising the same. On motion of Mr. Price it was

Resolved, That one hundred dollars (\$100) be appropriated out of the income of the Michaux fund, for a copy of the Michaux portrait, and frame, to be presented to the Park Commissioners, to be put in the Horticultural Hall, standing in the Michaux grove, where our Michaux lectures are delivered by Dr. Rothrock ; and the Michaux Committee attend to the subject.

An appropriation of forty dollars (\$40) was, on motion, made to defray the expense of an illustration for Mr. Ashburner's paper on Oil Sands in the printed Proceedings.

Mr. Fraley then stated that as the Society had left it with

him to appoint delegates to Boston, he requested the Secretaries to send information to each of the Board of Officers and to Dr. R. E. Rogers and to Mr. Wm. A. Ingham that he nominated them as delegates to represent this Society and assist on the 26th of May at the Centennial Celebration of the American Academy of Arts and Sciences in Boston.

The meeting was then adjourned.

Astronomical Approximations. IV. Nodal Estimation of the Velocity of Light. By Pliny Earle Chase, LL.D., Professor of Philosophy in Haverford College.

(Read before the American Philosophical Society, March 19, 1880.)

The accuracy of my approximation to the apparent semi-diameter of the Sun* is confirmed by the following kinetic considerations, some of which, though seemingly of great fundamental importance and character, have been generally overlooked.

1. Matter has been usually regarded as composed of discrete particles. This hypothesis enters even into the kinetic theory of gases. If it is true, all force must be transmitted from particle to particle and time must, therefore, be required to overcome the inertia of masses.

2. Attraction and repulsion have been generally considered under the influence of central forces, varying inversely as the squares of the distances from the centres and, therefore, producing motions with variable velocity.

3. Waves, orbital undulations, and other cyclical motions, are generally propagated with uniform or nearly uniform velocity, although they are often accompanied by subordinate movements with varying velocity. Variable velocities are often converted into uniform or nearly uniform velocities, as in the case of conical pendulums, planetary rotations and orbital revolutions.

4. In all undulations, and in all cyclical motions through an undulating medium, there are tendencies to synchronism. The synchronism may be complete, producing equal cyclical motions in equal cyclical times; or nodal, producing harmonic series of cyclical motions which are completed in equal times.

5. Newton showed that if a centripetal force varies as the distance of a body from the centre, all bodies, revolving in any planes whatsoever, will describe ellipses and complete their revolutions in equal times;† that bodies which move in right lines, running backwards and forwards alternately, will complete their several periods of going and returning in the

*Proceed. Am. Phil. Soc. xviii, 380.

† Principia, B. I, Prop. 47